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## THE TREATMENT OF PULMONARY TUBERCULOSIS \*

By H. H. WEIST, M.D.

PRELIMINARY to describing a method of treatment of pulmonary tuberculosis, it seems proper to consider very briefly certain established facts in regard to the disease itself. Pulmonary tuberculosis is a communicable disease, the element of contagion being a microscopic organism, the tubercular bacillus, which produces characteristic lesions in tissues, consisting of small masses or nodules called tubercles. Hence the name tuberculosis.

Prominent medical writers state that pulmonary tuberculosis is one of the most universal and benign of all the diseases with which human beings are afflicted. This startling and seemingly paradoxical statement is perfectly true, and abundant evidence can be offered to substantiate it. The frequency of the disease, as stated by various authorities, is in itself convincing proof. The statistics of Nagle show that between the ages of 18 and 30 ninety-six per cent. of all autopsies give evidence of tuberculosis, and that above 30 no individual is free. Osler expresses the opinion that one hundred per cent. of individuals are tuberculous. Accurate records in general hospitals and morgues of autopsies of bodies dead of other diseases show a percentage of healed tuberculosis varying from fifty to ninety per cent. according to different writers of different countries. With this evidence before you it must be sufficiently obvious that the whole tendency of the body is to recover from tuberculosis; if it were not so, we would all die of it.

Another very significant fact also proved beyond the cavil of a doubt, is that the tubercle bacillus will not grow or multiply in the fluids and tissues of a perfectly healthy body when received in the usual number. With these premises in mind, let us endeavor to reason logically to a conclusion as to what determines recovery of those who develop the disease and what enables others to offer resistance to its invasion. There can be no doubt that the factor in both instances is identical.

It has long been a matter of common observation by physicians that the outcome of treatment in a given case of tuberculosis cannot be predicted with certainty; far-advanced, extensive disease often clearing in the most surprising manner, while, on the other hand, cases are frequently seen in which the lesion, localized within narrow limits, remains

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unchanged after years of treatment, or, becoming active, extends and finally overwhelms the patient. The difference in outcome of these cases cannot always be explained by difference in age, sex, occupation, or surroundings. Further corroboration of this is borne out by the percentage of healed tuberculosis in the autopsy records which have been recited to you. These statistics were derived from general hospital cases and, therefore, from people of the poorer classes. Being poor, they remained during life in their accustomed environment—the most unfavorable according to accepted view—and, therefore, never received systematic treatment for tuberculosis, probably did not even know that they had the disease. Change to equable climate, higher altitude, purer air was not for these dependent poor, yet they recovered from tuberculosis, dying later from some entirely different disease. If we eliminate climate and systematic treatment, the only explanation left us is that these people, fortunately and not by the use of intelligent selection, obtained the right sort of food and in sufficient quantity to check the growth of tubercle bacilli. It has been established in the second premise that tubercle bacilli will not grow or multiply in a perfectly healthy body. Fundamentally, therefore, tuberculosis is a disease due to imperfect or malnutrition.

The first symptoms of tuberculosis are solely symptoms of disordered nutrition, then follow symptoms of malnutrition and the toxins generated in the growth of the tubercle bacillus and other bacteria. The treatment of tuberculosis, therefore, is inseparable from the study of food. It must seem obvious to you in this connection that, important as are the methods employed in the battle against tuberculosis, such as care of sputum, etc., specific directions as to food are of greater importance. I think they are paramount to every other method in the prevention and cure of tuberculosis. One who is properly fed can be compared to one who is successfully vaccinated and goes his way in perfect immunity.

In the great crusade waged against tuberculosis, it seems to me that sufficient cognizance is not taken of this important fact. In a successful warfare against tuberculosis, both the proximate and immediate causes of the disease must receive the same consideration because they are interdependent and of equal importance. In the effort at prevention by attempting to destroy the tubercle bacillus, why not lay equal emphasis on the fact that an efficient means of prevention consists in maintaining a well-nourished body, and at the same time offer to those who already have the disease the hope that the reestablishment of a proper nutrition offers the simplest, surest, and most readily available avenue for recovery?

The two methods are not antagonistic; on the contrary, they support and defend each other and an intelligent appreciation by laymen would go far toward removing the stigma of the disease felt by every sufferer.

The laity who are disposed to take a prominent part in the crusade should be better informed as to the complexity of the problem involved. Zeal without adequate knowledge has given rise to morbid fear, and while fear has undoubtedly been one of the greatest promoters of human progress, when it becomes hysterical it is emasculated and is no longer a well-balanced element of power. It rather sinks into weakness and stupidity, and from being a stimulating factor in human affairs, becomes a benumbing element. The scientific world has a wholesome fear of tuberculosis, but with this fear goes intelligence, courage, and a desire to extend protection from it. To show the correctness of this position and to bring the world to adopt it, should be one of the objects of medical science. To fear tuberculosis is to run from an idea, but to protect the tuberculous from others and from themselves is sane, sound, and effective; the very act of resisting a common danger energetically will dispel unreasonable fear. One should dispel the vague and nebulous ideas that project themselves in terrifying forms and strive for accurate and exact presentation, for known dangers incite us to caution while the unknown excite panic and phobias. When we have a precise knowledge of tuberculosis and its effect on mankind, and can show that many places have been freed from its ravages, and can demonstrate the exact means by which this has been accomplished, we shall have taken a long step toward substituting prudence for fright. That the world fears tuberculosis is undoubtedly true. The great mortality, the wide extent, the painful consequences, and the contagiousness of the disease are reasons enough for this. These features have always been characteristic of the disease, but they have recently been brought more vividly before the public by organized educational bodies, and designedly so. This has been done, however, not for the purpose of increasing their fears, but in order to promote their intelligence. It is the knowledge that an inundation is possible and the fear that it may come that has made the Dutch so careful and skilful with their dykes. The result of their precaution is that a threatening disaster is controllable. The study of the individual tuberculous patient shows that in him the contagion is controllable and that he may be rendered harmless to his fellows. One who knows how to manage such a patient can care for him in any stage of his disease with impunity. It is this knowledge which should entirely root out the fear of the disease.

A vast amount of educational propaganda has been made in this direction and it is effective in proportion as the people are receptive, *i.e.*, intelligent. You cannot preach down unreasonable fear; you must substitute something for it. Replace the generic idea of the disease by the thought of the individual who has it and offer a remedy which is within his reach. In this connection, I am not referring to the affluent or to the dependent poor who are provided for, but I am thinking of the wage-earner, the greatest sufferer when such affliction comes. So far as treatment of wage-earners is concerned, this class is completely ignored, as if the disease were considered never to exist among them. The plight of a tuberculous wage-earner in such a city as New York is distressing in the extreme. Rest, pure air, and an outdoor life, all of which are regarded as essential to the treatment of pulmonary tuberculosis, are patently beyond his reach. However, I have digressed too far from the main purpose of my paper, which is to describe a systematic, curative, dispensary treatment of pulmonary tuberculosis.

In order that you may appreciate the important rôle that food plays in the treatment of tuberculosis, and also that you may more readily comprehend the reasons for the adoption of a specific diet, it seems proper to consider for a moment the matter of dietetics in general. As you are well aware, food serves as the material out of which new tissues are constructed, old cells revived, and energy for running the bodily machinery derived. Development, growth, and vital activity all depend upon the availability of food in proper amount and of proper quality. Nothing, therefore, can be of greater importance than that man should know what constitutes proper food and its rational use. Yet almost nothing is more difficult or more misunderstood. As soon as it is a question affecting mankind, we have to take note of tradition and sentiment with regard to one of the main conditions upon which depend individual health, family prosperity, and the improvement of constitution and of race. It is well known how to feed a cow, a horse, or a sheep so as to cause them to produce the maximum of meat, of work, or of wool. Less seems to be known how to feed a man.

Nothing can take precedence of proper food in the preservation of public health, and when health is lost, nothing can be of more importance than to understand the leading principles guiding to the employment of diet as a powerful instrument for its restoration. Yet it is a lamentable fact, that the subject of dietetic treatment of disease has received scant attention in medical literature. The subject is too often dismissed with such vague and indefinite phrases as "The value of nutrition re-

quires mere mention," and favorite if not convincing expressions are "The patient should be carefully fed," and "General dietetic treatment is of primary importance," and "The patient should eat plenty of good wholesome food." With such directions, which convey nothing definite or accurate, the dieting must, indeed, be general.

A food may be defined as anything which, when taken into the body, is capable either of repairing its waste or of furnishing it with material from which to produce heat or nervous and muscular work. As life is impossible without heat and as body heat is produced by oxygenation, fresh air is here regarded as food. As you know, foods are classified as organic and inorganic and further classified as nitrogenous and non-nitrogenous. Inorganic foods include the mineral salts. The nutritive constituents of foods are further classified as proteids, carbohydrates, fats, mineral salts, and water. All diets mention these classifications, but it is interesting to note that few diets do more than merely mention mineral salts, although lime salts form three-fourths of the total mineral solids of the body and are found in all tissues and fluids.

It is the province of physiology which studies the healthy body to determine how much of each of these nutritive constituents is daily necessary to maintain a healthy man. This has been done by experiments upon healthy men, and from these experiments certain standard diets have been formulated. But is it logical to employ figures obtained by observation of those in normal health in calculating the quantity of nutritive elements for the sick? Yet it is the universal tendency to confuse healthy and sick in such matters.

The province of the physician is to treat the sick. There are no standard diets for different diseases, because there is nothing upon which to base a standard. One of the established facts, however, is that unless fat is stored in excess of the caloric needs of the body, an individual is not healthy. Masses of fat in various situations in the body, whatever the reason, are necessary for health. This does not mean obesity, but is true of every individual of normal development. Masses of fat, you will recall, are found surrounding the kidneys, and in the omentum much fat is stored. The marrow of the bones is rich in it, and the rounded contour of the body is due to fat. In wasting diseases, or diseases of malnutrition, what is it that wastes and is lost? Of the nutritive constituents the greatest loss is shown in fats, because the fat masses grow less. Tuberculosis is a wasting disease. Hence the popular name, consumption.

It is sufficiently obvious that if a healthy man needs only food enough to repair his daily waste, it must follow that the individual suffer-

ing from any of the wasting diseases must meet not only the current demand, but store the surplus required in health. The first indication in the treatment of the tuberculous, therefore, is that he must eat more food than he actually needs for his daily output, and in order to accomplish this successfully and without discomfort, cathartics are necessary to carry off the residue from the increased quantity of food. The necessary amounts of food can be determined only by experimentation with the individual and success or failure made manifest by regular weighing.

*(To be continued.)*

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## ORGANIZATION OF TUBERCULOSIS WORK IN SMALL CITIES AND COUNTIES

BY CHLOE JACKSON, R.N.

Executive Secretary Fayette County Anti-tuberculosis League, Lexington,  
Kentucky

THIS paper is not intended to present a systematic plan for the organization of tuberculosis work in small cities and counties, but rather to present some of the situations one must meet and to encourage rather than discourage those who may anticipate entering this field of work.

To one accustomed to the large city, with its many co-operative agencies, its splendidly organized Board of Health, its vital statistics, its parks and playgrounds, its social features, and its thousand and one attractions and helps, the work in small cities and rural districts is not apt to hold many alluring features. To one who has spent some years in a rural district or small city, who knows secrets of hills and fields, who enjoys the bubbling of brooks or the warbling of birds, who is a lover of nature or who is of a constructive turn of mind, the rural work offers many an allurements. When a call comes from a small city and rural district, there has been an awaking to something somewhere, a felt need. An organization may exist in name only, there may have been no definite organized work, all may be chaos. No matter what the condition, that there came a call, meant awaking; hold it and look well that no spark of interest be lost.

The field may impress you with its restfulness, its comfortable-looking homes with beautiful yards and gardens. The voices of happy, rollicking children reach your ear and, almost at the same moment, appears a hungry-looking urchin, poorly clad, and he seems to emerge from the house bountiful. You listen again, look, and if you are keenly alert, you will continue to look. You are now on the field of which you are to